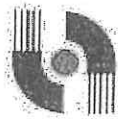


MULTIMEDIA



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STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2016/2017

TSE2101/TCS2411- SOFTWARE ENGINEERING FUNDAMENTALS

(All sections / Groups)

18th OCTOBER 2016
9.00am-11.00am
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 5 pages (including cover page) with 6 Questions only.
2. Attempt **ONLY FIVE** out of the **SIX** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please print all your answers in the Answer Booklet provided.

Question 1

(a) Explain how the principles underlying agile methods lead to the accelerated development and deployment of software. (4 marks)

(b) Performance and security may pose themselves as conflicting non-functional requirements when architecting software systems. Make an argument in support of this statement. (2 marks)

(c) Using the UML graphical notation for object classes, design an object class for 'A Bank Account' with attributes and operations. Use your own experience to decide on the attributes and operations that should be associated with the object. (4 marks)

Question 2

(a) Draw a sequence diagram showing the interactions involved when a student registers for a course in a university. Courses may have limited enrolment, so the registration process must include checks that places are available. Assume that the student accesses an electronic course catalog to find out about available courses. (4 marks)

(b) Self-adaptive systems can reconfigure themselves, augment their functionality, protect themselves and recover from failure. Adaptive requirements document the variability needed for self-adaptive systems. List FOUR examples of the variability as mentioned. (4 marks)

(c) What do use case 'exceptions' represent? (2 marks)

Continued...

Question 3

(a) Describe the following software design concepts. For each concept, explain why the software quality can be improved with its implementation. (6 marks)

- Functional Independence
- Modularity
- Separation of Concern

(b) Draw the architecture diagram from your group assignment during the course and explain the importance of software architecture. (4 marks)

Question 4

(a) SoftHouse Sdn Bhd is a software company that has obtained ISO 9000 certification for its software development process. Explain what this certification tells you in terms of the products developed by the company and the management of the projects in the company.

(6 marks)

(b) Describe ANY FOUR Software Quality Assurance activities that are necessary to ensure the quality of software. (4 marks)

Continued...

Question 5

(a) Company A is using white box testing and black box testing as two main approaches in testing for a new software.

- Explain and contrast white box and black box testing approaches. (4 marks)
- Mr. Ben, one of tester has no programming knowledge. Which approach should he be assigned to? (1 mark)
- Miss Serina is responsible for the higher levels of testing such as acceptance testing and system testing, which approach she should be using? (1 mark)

(b) Based on the flowgraph, determine the cyclomatic complexity of this program. (2 marks)

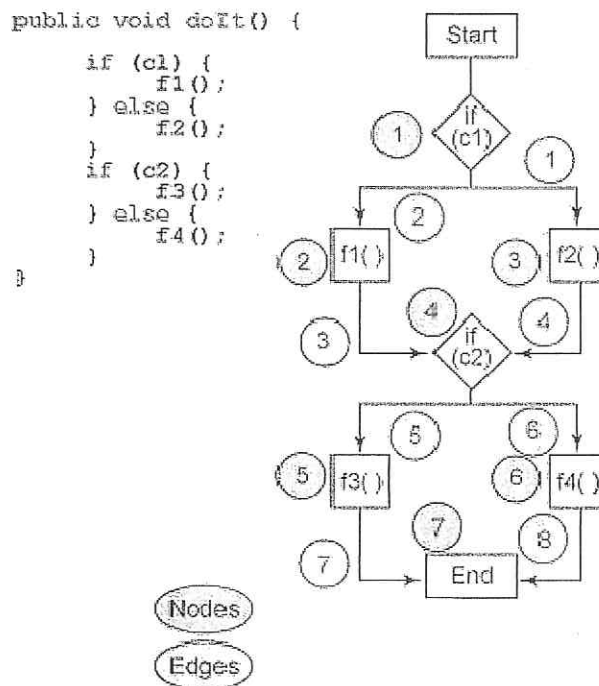


Figure 1. Flowgraph

(c) How many test cases are required to complete test all the paths of this program?

(2 marks)

Continued...

Question 6

(a) What is "activity-on-arc" or "activity on arrow" (AOA) diagram? Explain the importance of AOA in finding the critical path. (2 marks)

(b) Draw an AOA Diagram based on Table 1. (5 marks)

Table 1.

<i>Activity</i>	<i>Description</i>	<i>Required Predecessor</i>	<i>Duration</i>
A	Product design	(None)	5 months
B	Market research	(None)	1
C	Production analysis	A	2
D	Product model	A	3
E	Sales brochure	A	2
F	Cost analysis	C	3
G	Product testing	D	4
H	Sales training	B, E	2
I	Pricing	H	1
J	Project report	F, G, I	1

(c) List all possible paths in (b) and calculate the duration. Find the critical path using AOA. (3 marks)

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